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INFLATION, UNEMPLOYMENT, AND PUBLIC
OPINION POLLS.

Stanley Fischer and John Huiizinga*

Number 256

April 1980

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* Department of Economics, M.I.T. Research support from the National Science Foundation is acknowledged with thanks. We are grateful for assistance and/or advice from Robert Burkhardt, Robert Comment, Thomas Juster, Michael Kagay, Warren Mitofsky, Franco Modigliani, Lucas Papademos, Marilyn Potter of the Roper Center at the University of Connecticut, and the Gallup Organization. Preliminary results of the research described in this paper were presented in Fischer and Modigliani (1977).



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Stanley Fischer and John Huizinga*

It is well known that public opinion polls report that the public regards inflation as a more serious problem than unemployment. In this paper we examine public opinion surveys with the aim of discovering what, if anything, the poll results mean. We describe in some detail the questions about inflation and unemployment asked in the surveys and analyze the determinants, in both cross-section and time series, of answers to those questions.

The typical opinion poll question about inflation and unemployment is "Which of the two problems--inflation or unemployment--do you think will cause the more serious economic hardship for people during the next year or so?"¹ Section I discusses the possible issues to which opinion poll questions about inflation and unemployment might be relevant. Section II tabulates a variety of questions that have been asked, along with the responses, and examines the views expressed and their consistency, both internal and across different polls. Section III presents a regression analysis of the cross-sectional determinants of responses to the Michigan poll question cited above, while Section IV studies determinants of changes over time in aggregate responses to the same question. Section V brings the analysis of the preceding sections together in an attempt to answer the question of what the poll results mean.

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I. The Issues.

Public opinion questions about inflation and unemployment have addressed three basic issues: (1) the relative costs of inflation and unemployment to society (2) the relative costs of inflation and unemployment to the individual (3) whether economic policy should be directed towards reducing inflation or reducing unemployment. The last issue of course presumes that there is such a trade-off.

Ideally, the evaluations of issues (1) to (3) would have some explicit consideration of the time paths of inflation and unemployment being considered. For instance, individuals might be asked to rank the costs of 1% more unemployment for a year against those of an inflation rate that is permanently higher by x%. Unfortunately, the typical question asks only about the costs of inflation and unemployment (perhaps over the next year), without any explicit indication of the possible tradeoffs between them.

Given this type of question, there can be a real distinction between a person's views on issues (1) and (2) and his view on issue (3). For example, someone who believes society should be willing to pay the price of a temporary recession to lower the inflation rate permanently might nonetheless answer at the beginning of a recession that unemployment will cause more serious hardship than inflation over the next year.

We will see below that questions relevant to all three issues defined above are asked in the polls. However, there is little attempt to make precise the tradeoff that the individual is being asked to consider.

II. Poll Questions and Answers.

A large number of regularly conducted opinion polls ask questions about inflation and unemployment.² In this section we report selectively on poll questions that relate to specific issues described below.

1. The Overall Importance of the Inflation and Unemployment Problems.

The first question in Table 1 has been asked by the Gallup organization since 1935. The question is of course open ended and therefore makes it possible to ascertain the importance attached to inflation and unemployment relative to other problems facing the nation. Given that the poll started during the Great Depression and continued through several wars, changes in the relative ranking of economic problems should not be attributed solely to increasing awareness of their importance.

Figure 1 shows the history of responses to the Gallup poll question since 1939.³ With only two exceptions, over 50% of the respondents named either inflation or unemployment as the most serious problem facing the country in every poll since September 1973; on several occasions the combined percentages were above 80%. Also noticeable is how quickly after World War II concern over unemployment faded; thereafter it was essentially only in recessions that unemployment was ranked as a more serious national problem than inflation.⁴ Given the prominence of the inflation and unemployment issues since 1973, it is likely that the public by now has well formed opinions on their relative importance.

It is perhaps not necessary to point out that Figure 1 shows the public generally regards inflation as a more serious problem than unemployment--as is confirmed also by Figure 3 below.

TABLE 1

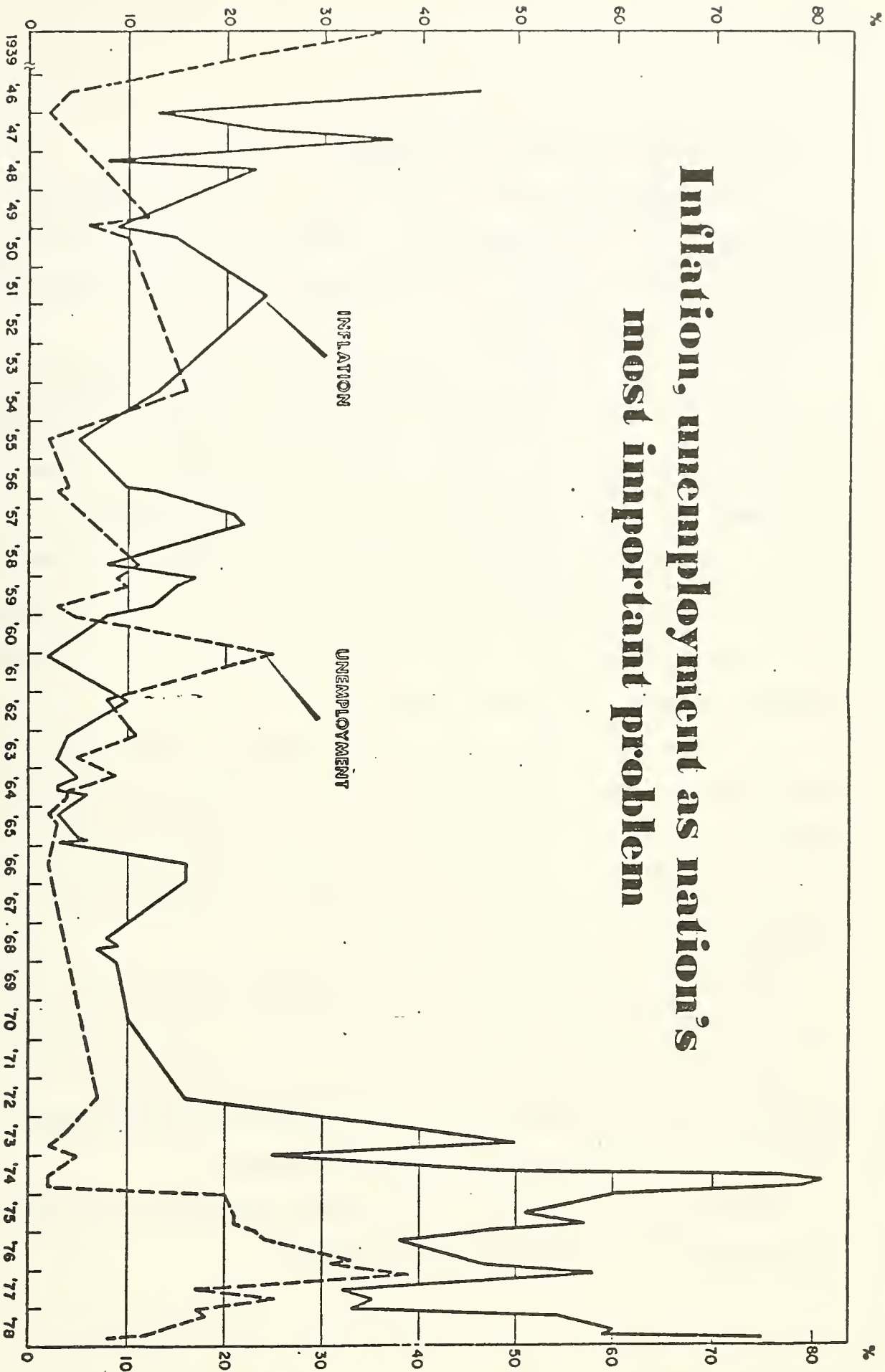
Opinion Survey Questions on Inflation and Unemployment

Organization	Period	Question	Code*
American Institute of Public Opinion (Gallup)	1935-Present	What do you think is the most important problem facing this country (sometimes, this section of the country) today?	G
Institute for Social Research: University of Michigan	1974-Present	Which of the two problems- inflation or unemployment -- do you think will cause the more serious economic hardship for people during the next year or so?	M
New York Times/ CBS	1976-Present	Which do you think is the most important problem facing the country today - unemployment or inflation?	N
The Harris Poll	1974-Present	If you had to choose, which do you think is a more serious problem for the country today - rising prices or high unemployment?	H1
The Harris Poll	1975-Present	If you had to choose, which do you think is a more serious problem for you and your family today - rising prices or high unemployment?	H2

Sources: Gallup: The Gallup Opinion Index, November 1978, Report #160; Harris: Press Release, March 20, 1978, ISSN 0046-6875; Michigan: Mimeos released by Survey Research Center; New York Times/CBS: Telephone conversations and computer print-out. *Code is for coding in Table 2.

Figure 1

Inflation, unemployment as nation's most important problem



Note: Reproduced from Gallup Opinion Index (November 1978), Number 160.

2. Consistency of Responses Across Polls.

The remaining questions in Table 1 ask for a direct comparison of the costs of inflation and unemployment. Although, as noted above, the comparison is not well defined, it is worthwhile checking for consistency of responses in different polls.

Table 2 shows the results of the Michigan (M), New York Times/CBS (N) and Harris (H1) polls to similar questions asked around September 1976. The aggregate responses are similar. Results of the Gallup poll taken at the same time are out of line with those of the other three polls. However, given the possibility of answers other than inflation or unemployment to the Gallup question, it would be necessary to assume the irrelevance of independent alternatives for the Gallup results in Table 2 to be expected to coincide with those of the other polls.

The Gallup poll results are even more different in February 1975. Indeed, there does not appear to be a systematic relationship between answers to the Gallup and other polls.⁵ This likely means that alternatives excluded when individuals are asked to rank inflation and unemployment affect the comparison.

Although the differences between the Michigan and Harris polls are larger in February 1975 than in September 1976, both polls show unemployment being regarded as the more serious problem in the earlier period. Further, the difference between those poll responses is at its largest in early 1975, a period of rapidly changing unemployment.

The basic picture is thus one of substantial similarity of responses to similarly worded questions in different polls.

TABLE 2

<u>Question</u>	<u>Period</u>	Per cent Responding	
		<u>Inflation</u>	<u>Unemployment</u>
G	1976 Oct.	60.3	39.7
M	1976 Aug/Sept	55.1	44.9
N	1976 Sept.	52.2	47.8
H1	1976 Aug	51.3	48.7
G	1975	75.0	25.0
M	1975 Feb.	32.8	67.2
H1	1975 Feb.	42.0	58.0
H2	1975	84.1	15.9

Notes: Those who answered Don't Know or Both are dropped from these samples.

3. Social versus Personal Costs of Inflation.

The different responses, shown in Table 2, to the last two questions in Table 1 (H1 and H2) reveal the clear distinction individuals draw between the individual and social costs of inflation and unemployment. In February 1975 over 80% of the respondents to the Harris poll said that rising prices were a more serious problem for their families than was unemployment. But at the same time less than half the respondents thought inflation was a more serious problem for society.⁶

It is thus clear that individuals' responses to the standard inflation/unemployment question, M in Table 1, do not reflect only perceptions of their self-interest. In Section III of the paper we investigate the factors affecting individual perceptions of the social costs of inflation and unemployment.

4. Is There a Trade-Off Between Inflation and Unemployment?

Table 3 presents a series of questions dealing with the trade-off between inflation and unemployment. The first asks whether such a trade-off exists. A large majority of the respondents believed it does.⁷ The question is not sufficiently detailed to make it clear whether individuals believe there is a long-run trade-off.

5. Should Unemployment be Increased to Reduce Inflation?

The remaining questions in Table 3 relate to whether the inflation unemployment trade-off should be used to reduce inflation. In all the polls shown, the responses are that policy should be directed towards reducing unemployment. This applies to polls from October 1975 through April 1979, even when the Michigan poll for the same period (the standard question) shows more people regarding inflation as being a more serious

TABLE 3. Results

Michigan Poll Results
for Same Period

Organization and Date of Poll.	Question	Is	Is Not	Not Sure	Infl-ation	Unemploy-ment	Both
Yankelovich, Skelly and White (YSW), for Time magazine, April 1976.	(a)...Will you tell me... whether you feel this is or is not a choice the American people will have to make in the next few years... Either high inflation or high unemployment. (b) Well supposing you had to choose, which alternative would you personally choose--the first or the second one.	62 First 40	22 Second 30	16 Not Sure 30	67	24	7
YSW, August 1976 1544 respondents	Let's talk about the economy. Some people feel that the main priority has to be reducing unemployment which is now over 8%; others say that the main priority has to be curbing inflation even if it means a continued high unemployment rate. Do you personally feel that the main priority has to be providing jobs or curbing inflation even if it means continued high unemployment?		Jobs 54	Infl-ation 46	48	39	11
YSW, Nov. 1977 1050 respondents	In terms of the economy, do you feel that the main priority ... has to be directed towards curbing inflation or providing jobs and reducing unemployment?	Jobs 44	Infl-ation 31	Both (Volunteered) 21	52	37	9

TABLE 3 (Contd)

Michigan Poll Results
for Same Period

Results

Question

Roper Organization (Roper Reports)	Question	Less Price Rise	More Employed	Don't Know	Infl- ation	Unemploy- ment	Both
October 1975	If we have to choose between high unemployment and continuing inflation, which would you favor--letting unemployment stay high and having less of a rise in prices, or letting prices rise and having more people employed?	19	59	23	46	36	16
October 1976	"	23	53	24	49	38	10
May 1978	"	30	52	18	63	26	8
September 1978	"	24	53	23	65	26	5

Source: Roper Center.

problem than unemployment.

There is no necessary inconsistency between believing that inflation imposes greater costs on society than unemployment, and not being willing to incur the costs of higher unemployment to fight inflation. In terms of Figure 2, assume that public has indifference curves between inflation and unemployment. These are negatively sloped, with utility rising towards the southwest. They are drawn linear, in the absence of a priori restrictions on their concavity. Presumably individuals answer the question of whether inflation or unemployment is more costly by considering the slope of the indifference curves.

Figure 2 also contains a Phillips curve, labelled PP, showing the terms at which individuals believe inflation and unemployment can be traded off. Now consider an individual who expects to be at point A in the next period. If the slope of the indifference curve at A is sufficiently flat, he may well say that inflation is the more serious problem. Yet if PP is even flatter, as illustrated, he will want policy to be directed at reducing unemployment.

There is an alternative interpretation of the meaning of the answer to the standard poll question that makes it possible for individuals to answer that inflation is the more serious problem but that policy should be directed towards reducing unemployment. Individuals might be considering whether society would be better off if it could eliminate inflation entirely while keeping the unemployment rate at its expected level, or by eliminating unemployment (perhaps reducing it to the natural rate) while keeping inflation at its expected level. In terms of Figure 2,

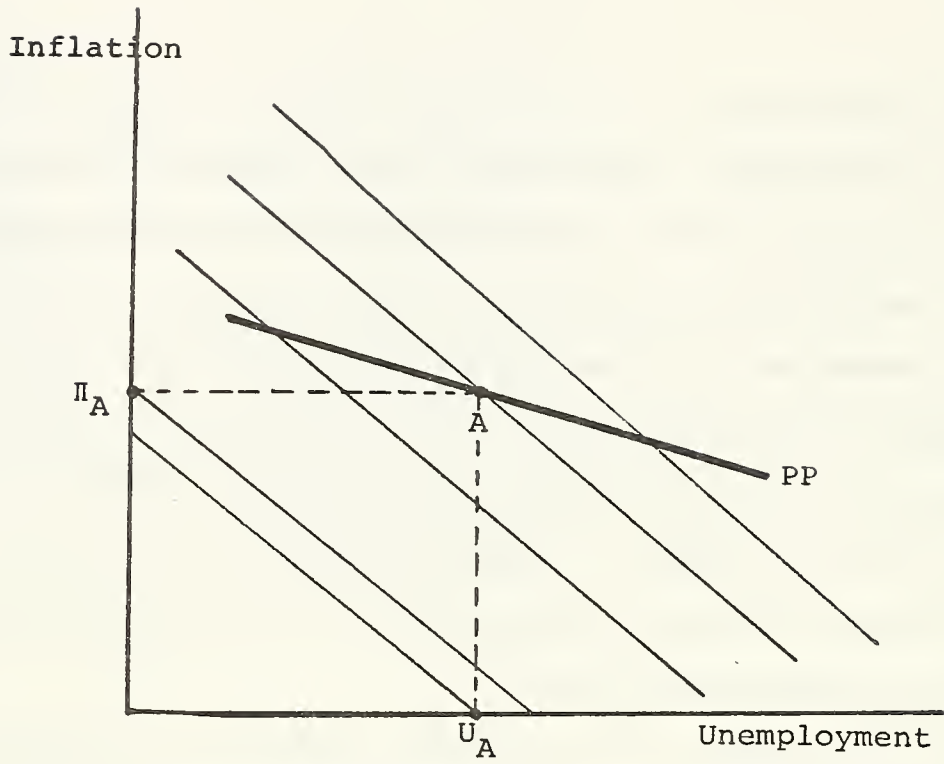


Figure 2.

they would answer that inflation is the more serious problem if the indifference curve through point U_A were below that through point Π_A . The policy choice would still be determined by the relative slopes for the PP and indifference curves through point A.⁸

6. Links Between Inflation and Nominal Income.

Table 4 contains the last set of survey questions and responses in this section. They are designed to shed some light on what we call the "misunderstanding hypothesis", which seems to have developed in response to the difficulty of explaining the economic costs of inflation relative to those of unemployment. The hypothesis claims that the public dislikes inflation because it fails to link increases in its own nominal income with inflation, on which, however, increases in the cost of living are blamed.⁹

The evidence for the misunderstanding hypothesis is difficult to find. It may originate from the 60's when inflation was sufficiently low that it may not have been systematically incorporated in individuals' thinking. The evidence in Table 4 is mixed. It is implausible that 70% of the respondents to the Roper poll in April 1978 had their incomes rise by less than the cost of living over the previous few years. The answers to the December 1978 NBC/Associated Press poll, however, show little support for the misunderstanding hypothesis. Part of the difference between the results of the two first polls in Table 4 may result from the difference between "family" and "your" income, since rising family income in the seventies has been in large part attributable to increasing labor force participation.

TABLE 4.

Results

Question

Organization and Date of Poll

Roper Report, April/May 1978
 Approx. 2000 respondents

During times of inflation, prices and services go up, but so do most people's incomes. How do you feel about your own personal circumstances over the past couple of years--would you say your income has gone up more than the cost of living, or that the cost of living has gone up more than your income, or that your income has about kept pace with the cost of living?

Income up more	Cost of living up more	Income has kept pace	Don't know
5	70	20	5

NBC/Associated Press, Dec. 1978
 1600 respondents

Has the inflation of the last few years reduced your family's standard of living? (If yes) would you say it has reduced your standard of living by a great deal, some, or only a little.

No Deal	Great Deal	Some	Only a Little	Not Sure
48	14	24	13	1

YSW, April 1979

(a) ...Will you tell me... whether you feel this is or is not a choice the American people will have to make in the next few years ... Either annual raises in pay with continued inflation or no raises in pay with stable prices.

Is	Is Not	Not Sure
68	22	10

(b) Well supposing you had to choose, which alternative would you personally choose--the first or the second one.

First	Second	Not Sure
24	63	13

Source: Roper Center.

The last question in Table 4 is included to show that when the question is put directly, the public does see a connection between pay raises and inflation. But this is only weak evidence against the misunderstanding hypothesis, whose proponents would not necessarily question the ability of the public to understand that higher pay raises will lead to price rises. The misunderstanding is rather that the public is supposed not to understand that inflation also raises nominal incomes.

Although the evidence on the misunderstanding hypothesis is weak, it is significant that we have been able to find no strong evidence in its support.

7. Sensitivity to the Wording of the Questions.

There is evidence that answers to poll questions are highly sensitive to the wording of the questions.¹⁰ Such difficulties do not arise in the responses to the Michigan, Harris (H1) and New York Times/CBS poll questions in Table 1, even though there are slight differences in the wording of the questions.

One difference in the wording of the questions merits special attention. The Michigan and New York Times/CBS polls ask about inflation while the Harris poll asks about rising prices. It is sometimes argued that there is a popular confusion between inflation and "high prices". Indeed, examination of the questions asked by the poll takers suggests that they sometimes confuse high and rising prices. For example, in October 1970 Gallup asked the following question:

"When people around here go to vote on November 3rd for a candidate for Congress, how important will inflation--the high cost of living--be in their thinking..." In addition, Gallup clearly refers to the high cost of living and inflation interchangeably in its own reports.¹¹

Despite this confusion by some poll takers, the evidence is that associating inflation with high rather than rising prices does not seriously affect the poll results. As Table 2 shows, the Harris and New York Times/CBS polls elicit essentially the same responses even though the former asks about rising prices and the latter about inflation. Of course, this does not necessarily mean that the public draws a tight distinction between high and rising prices; it means only that even when the distinction is made explicit poll responses are similar.

8. Summary.

The material reviewed in this section relates to the general issues discussed in Section I in several ways. First, the results of the Gallup poll in Section II.1, and those of the polls examined in Section II.2 and II.3 show that the public does indeed regard inflation as having a substantial social cost relative to unemployment--and also that inflation and unemployment have in the seventies been regarded as the most serious of all problems facing the nation. Second, the Harris poll results discussed in Section II.3 show that the public draws a clear distinction between the personal and social costs of inflation and unemployment: the social costs of inflation relative to unemployment are regarded as relatively lower than the personal costs. On the third issue specified in Section I, the public

generally believes that economic policy should not aim to reduce inflation by increasing unemployment. We have, in this section, attempted to reconcile the apparent inconsistency between the belief that inflation is the more serious problem than unemployment with the argument that unemployment should not be increased in order to fight inflation.

We turn now in Section III to an intensive examination of the factors determining individual responses to the standard (Michigan) poll question.

III. Determinants of Individual Responses.

In this and the next section we examine in detail the determinants of answers to the Michigan (standard) question listed in Table 1. Because the Michigan poll has been taken more regularly and over a longer period than other polls that ask for a comparison of the costs of inflation and unemployment, it provides sufficient data to do both cross-section and time series analysis.¹² We start in this section with the cross section analysis.

The Michigan question asks whether inflation or unemployment will cause more serious economic hardship "for people" over the next year. We assume that respondents answer this question on the basis of their perceptions of social welfare. Our implicit model of the individual is that some set of characteristics, which change slowly or not at all, determines his underlying attitudes to inflation and unemployment as summarized, say, in the indifference curves in Figure 2. Given these attitudes, current and/or expected rates of inflation then determine

the individual's actual rate of substitution between inflation and unemployment and determine the response to the poll questions.

We have studied cross sectional data from five Michigan surveys, those of Winter (February) 1975, Fall (November) 1975, December 1977, February 1978, and May 1978. Simple relationships between the answers to the poll question and some characteristics of the respondents are presented in Table 5, for three of the surveys:¹³ Winter and Fall 1975, and December 1977. The Winter 1975 poll is one of the few in which there is a clear majority who regard unemployment as the more serious problem. It was taken at a time when the unemployment rate had risen from 5.5% in August 1974 to 7.9% in January 1975 and was about to rise by another 1% in the next four months. Prices (CPI) had risen nearly 12% over those of a year before; the inflation rate was about to fall to under 5% in first quarter of 1975 (seasonally adjusted CPI, April over January, 1975). The Fall 1975 poll was taken at a time when both the unemployment and inflation rates were falling. The December 1977 poll was taken at a time of falling unemployment and rising inflation.

It is useful in the cross section framework to categorize explanatory variables into three classes. First, some variables such as age, race or ethnic grouping, and sex are truly exogenous for the individual. Second, characteristics such as income and education are unlikely to be significantly influenced by attitudes toward inflation and unemployment, even though these are in some sense choice variables for the individual.

Finally, variables such as home ownership, the extent of nominal indebtedness, and political affiliation, would likely reflect underlying attitudes to inflation and unemployment. Correlations between this third type of variable and poll responses therefore have to be interpreted with care. The entries in Table 5 show, for a variety of categories,¹⁴ the percentage of those answering either inflation or unemployment who answered inflation to the standard question. For simplicity we refer to this number as an index of inflation aversion, or merely inflation aversion.

We start in Table 5 with the relationship between income and inflation aversion. It has been observed by Hibbs (1976) that inflation aversion is positively associated with income in the cross-section. The overall relationship seen in Table 5 is one in which income and inflation aversion are positively correlated, but it is only in the Fall poll that the relationship is monotonic.

The second set of entries in Table 5 relate to employment status. Here there is fairly high level of concern among the unemployed themselves about inflation. This is another piece of evidence that perceptions of individual and social welfare differ.¹⁵

For the next two characteristics tabulated, the endogeneity issue becomes important. Home owners are on average more inflation averse than those who do not own homes.¹⁶ While this may appear surprising in light of the fact that those who own homes have a good hedge against inflation, it will be recalled that people are not answering in their personal interest. Further, causation could run from inflation aversion

Table 5: Cross-Sectional Responses to Michigan Surveys, by
Characteristics of Respondents.

Characteristic	Poll Date	Percentage Responding Inflation ¹ by Category						
		0-4.9	5-9.9	10-14.9	15-19.9	20+		
(1) Household Income \$1,000's	75:I	27.2 (114) ²	33.9 (186)	40.5 (220)	29.9 (142)	39.2 (163)		
	75:IV	50.8 (257)	52.7 (278)	53.3 (288)	59.8 (206)	61.5 (279)		
	77:12	43.6 (118)	59.4 (245)	63.4 (264)	62.9 (232)	63.5 (349)		
(2) Employment Status		Not in Labor Force	Working > 20 hrs/wk	Working < 20 hrs/wk	Temporarily Laid Off	Unemployed or looking for work		
	75:I	-- Unavailable for this period --						
	75:IV	54.1 (555)	56.2 (783)	41.7 (66)	66.7 (12)	50.8 (61)		
	77:12	57.1 (242)	61.6 (864)	66.3 (43)	28.6 (14)	54.2 (36)		
(3) Home Ownership		Yes		No				
	75:I	-- Unavailable for this period --						
	75:IV		56.3 (791)		51.4 (552)			
	77:12		59.9 (609)		56.8 (190)			
(4) Politics		Strong Democ.	Demo- crat	Indep. Democ.	Indep.	Indep. Repub.	Repub.	Strong Repub.
	75:I	28.8 (146)	32.8 (204)	40.2 (107)	38.8 (170)	36.0 (75)	39.1 (124)	31.1 (61)
	75:IV	46.5 (231)	51.3 (341)	53.1 (181)	58.4 (298)	55.7 (118)	60.8 (196)	64.4 (91)
	77:12	-- Unavailable for this period --						

Note: ¹ Entries in each cell are percentages responding inflation to the inflation/unemployment question, assigning "Both" equally to the inflation and unemployment categories, and omitting "Don't Know", etc.
² Numbers in parentheses indicate number of respondents with the relevant characteristic who answered the inflation/unemployment question (excluding "Don't Know").

to home ownership: fear of inflation may cause individuals to become home owners. In addition, homeowners presumably have higher incomes than non-owners and the ceteris peribus relationship may not be as shown in the table.

The fourth entry in Table 5 shows a fairly strong relationship between political affiliation and attitudes toward inflation, stronger in the 1975:IV poll than in the 1975:I poll, however. Both polls demonstrate that among Democrats, the extent of political identification with the party is strongly and positively correlated with an aversion to unemployment. For Republicans there is the anomaly that strong Republicans worried relatively more about unemployment than did other Republicans in 1975:I. Nevertheless, it is appropriate to say that on average, inflation aversion is related to political affiliation. As in the case of home ownership though, the causation is not obvious.

The relationships in Table 5 obviously cannot be regarded as representing the partial effects of the specified characteristics on attitudes toward inflation and unemployment. Accordingly, we have run a series of maximum likelihood regressions in an attempt to isolate the effects of factors such as income, education, age, sex, race, expected inflation and expected unemployment.¹⁷ Political affiliation, home ownership, and employment status have been excluded from the regressions. We do not have the unemployment variable for most periods. The other two variables are excluded because of the endogeneity problems discussed earlier.

The regression model, which assumes that the dependent variable can take on one of three discrete values, is described in Appendix 3.¹⁸ It is

assumed that the probability a person answers inflation is a function of the slope of his indifference curve and that the slope is a function of the regressors used in the equation. The three choices for the dependent variable are "inflation", "unemployment", or "both". The regression maximizes the likelihood function by assigning weights to the regressors and choosing an interval in which the individual responds "both" when asked which is a more serious problem.

Regression results for all five periods we have examined are presented in Tables 6 and 7. Positive coefficients in Table 6 indicate that the probability of answering inflation increases with the right hand side variable. B/H indicates whether a respondent is black or hispanic (one category) or not. The variable takes on the value one for whites and two for blacks and hispanics. The sex variable is one for males and two for females. We do not report the coefficients defining the interval of indifference in which individuals answer "both", or the constant terms, in order to reduce clutter. Appendix 4 contains those numbers, as well as a description of the scaling of the other right hand side variables.

The three variables that enter most significantly are the two expectational variables and B/H. The coefficient on expected inflation is significantly different from zero in every time period and those of B/H and expected unemployment are significant in four out of five periods. Clearly, individuals' ranking of the costs of inflation and unemployment depends on the levels of those variables. The significant sign on the B/H variable indicates that blacks and hispanics feel unemployment is a more serious problem for the

Table 6: Multinomial Probit Regressions Explaining Inflation/Unemployment Responses.

Date of Poll	Regression #	-Log likelihood function	Independent Variables				
			<u>Income</u>	<u>Education</u>	<u>Education+</u>	<u>Age</u>	<u>Age²</u>
Feb. 75	1	586.26	.027(0.9)	.164(2.2)	-.320(1.7)	-.106(0.7)	.014(0.7)
Dec. 75	2	1119.49	.018(0.9)	.121(2.2)	-.242(1.6)	.026(0.2)	.000(0.0)
Dec. 77	3	829.98	.022(0.9)	.050(0.8)	-.171(1.1)	.093(0.8)	-.008(0.6)
Feb. 78	4	715.89	.010(0.4)	.055(0.8)	-.062(0.4)	.240(1.9)	-.027(1.8)
May 79	5	740.95	.025(1.1)	.156(2.4)	-.264(1.6)	.245(2.0)	-.025(1.7)
			<u>B/H</u>	<u>Sex</u>	<u>Expected Unemployment</u>	<u>Expected Inflation</u>	
	1 (cont'd)		-.133(0.8)	-.158(1.7)	-.049(1.5)	.081(3.2)	
	2 (cont'd)		-.363(3.1)	-.057(0.8)	-.119(5.1)	.088(4.1)	
	3 (cont'd)		-.640(4.7)	-.098(1.2)	-.114(3.9)	.124(5.5)	
	4 (cont'd)		-.610(4.3)	-.034(0.4)	-.132(4.5)	.065(2.7)	
	5 (cont'd)		-.742(5.7)	-.093(1.1)	-.078(2.6)	.052(2.3)	

Notes: 1. t-statistics in parentheses

2. Education + is a dummy variable for 16+ years of education.

country relative to inflation than do whites, even after standardizing for expectations and other variables, such as income, in the regressions.

None of the remaining demographic variables enter in a consistently significant way, however. The coefficient on income is positive in each case, but with a t-statistic that is usually around unity. Income per se is not strongly related to how the public views the relative costs of inflation and unemployment; the simple relationship found in Table 5 is misleading. Next to B/H, the education variable comes the closest to being consistently significant, with a positive effect on inflation aversion that is significant in three periods. Inflation aversion appears to increase with education until the post college level, although the educational dummy for 16+ years of education is never significant. Age and age squared show some signs of contributing explanatory power in later periods. The sex variable has a negative coefficient in each period, implying women are more worried about unemployment than men, but the effect is never significant.

Table 7 presents calculations that help interpret the magnitudes of the coefficients in Table 6. The data in Table 7 are estimates of the probability that individuals with the specified characteristics will respond inflation to the poll question. The standard case is that of white male with twelve years of education, income of \$15-20,000, aged 35-44, expecting 5% inflation and no change in the unemployment rate. The standard case remains constant across time. In Table 7 the characteristics are varied one at a time from the standard case.

The table shows very little sensitivity of the probabilities to

TABLE 7: Probability of Answering Inflation: Interpretation of Table 6.

Date of Poll	Regression #	Independent Variable						
		INCOME			EDUCATION			
		10-15,000	15-20,000	20-25,000	12	13-15	16+	
Feb. 75	1	(.382)	(.393)	(.404)	.393	.426	.396	
Nov. 75	2	(.533)	(.540)	(.547)	.540	.587	.540	
Dec. 77	3	(.621)	(.629)	(.637)	(.629)	(.648)	(.602)	
Feb. 78	4	(.655)	(.659)	(.663)	(.659)	(.680)	(.677)	
May 78	5	(.744)	(.752)	(.760)	.752	.799	.767	
		AGE			B/H		SEX	
		18-20	35-44	65+	Black/Hispanic	White	Male	Female
Feb. 75	1	(.435)	(.393)	(.449)	(.343)	(.393)	(.393)	(.334)
Nov. 75	2	(.509)	(.540)	(.571)	.396	.540	(.540)	(.517)
Dec. 77	3	(.568)	(.629)	(.634)	.378	.629	(.629)	(.591)
Feb. 78	4	.538	.659	.594	.421	.659	(.659)	(.627)
May 78	5	.626	.752	.723	.476	.752	(.752)	(.712)
		EXPECTED UNEMPLOYMENT			EXPECTED INFLATION			
		Less	Same	More	0%	5%	10%	
Feb. 75	1	(.429)	(.393)	(.357)	.329	.393	.457	
Nov. 75	2	.595	.540	.445	.473	.540	.607	
Dec. 77	3	.711	.629	.547	.540	.629	.718	
Feb. 78	4	.760	.659	.558	.613	.659	.705	
May 78	5	.799	.752	.705	.720	.752	.784	

Note: Parentheses indicate that the variables did not enter significantly in that time period.

income and sex. A doubling of income from \$12,500-\$25,000 would increase the predicted probability by less than 2% in most cases. The average difference between males and females is under 4%. The effect of education is about the same. The average difference between high school graduates and those who receive some college education but do not graduate is about 3%, with additional education erasing this difference.

The effect of age on attitudes to the social cost of inflation and unemployment can be substantial at times and seems to be growing. By the end of 1978 there was an estimated 13% higher probability that someone age 35-44 would see inflation as the more serious problem than would someone 18-20. The parabolic nature of the age relationship found in the later periods shows middle aged persons to be the most concerned about inflation. B/H has the strongest quantitative effect on the estimated probabilities. With the exception of the first period, whites have at least a 15% higher predicted probability of choosing inflation as the more serious problem than do blacks and hispanics. By late 1978 the difference had reached 28%.

The last two variables in Table 7, the expectational variables, are also seen to have large effects on the inflation-unemployment response. Increasing inflation expectations from 0% to 10% increases the probability of answering inflation by an average of 12%, but this effect is larger in the earlier polls. The effects of differences in expected unemployment are of the same magnitude. Those who expect unemployment to fall have on average about a 14% higher probability of naming inflation as the more serious problem than do those who expect

unemployment to rise.

In summary then, the regressions show that only the expectational variables and B/H contribute consistently, significantly, and with large empirical effects to determining individuals' perceptions of the social costs of unemployment relative to inflation.¹⁹

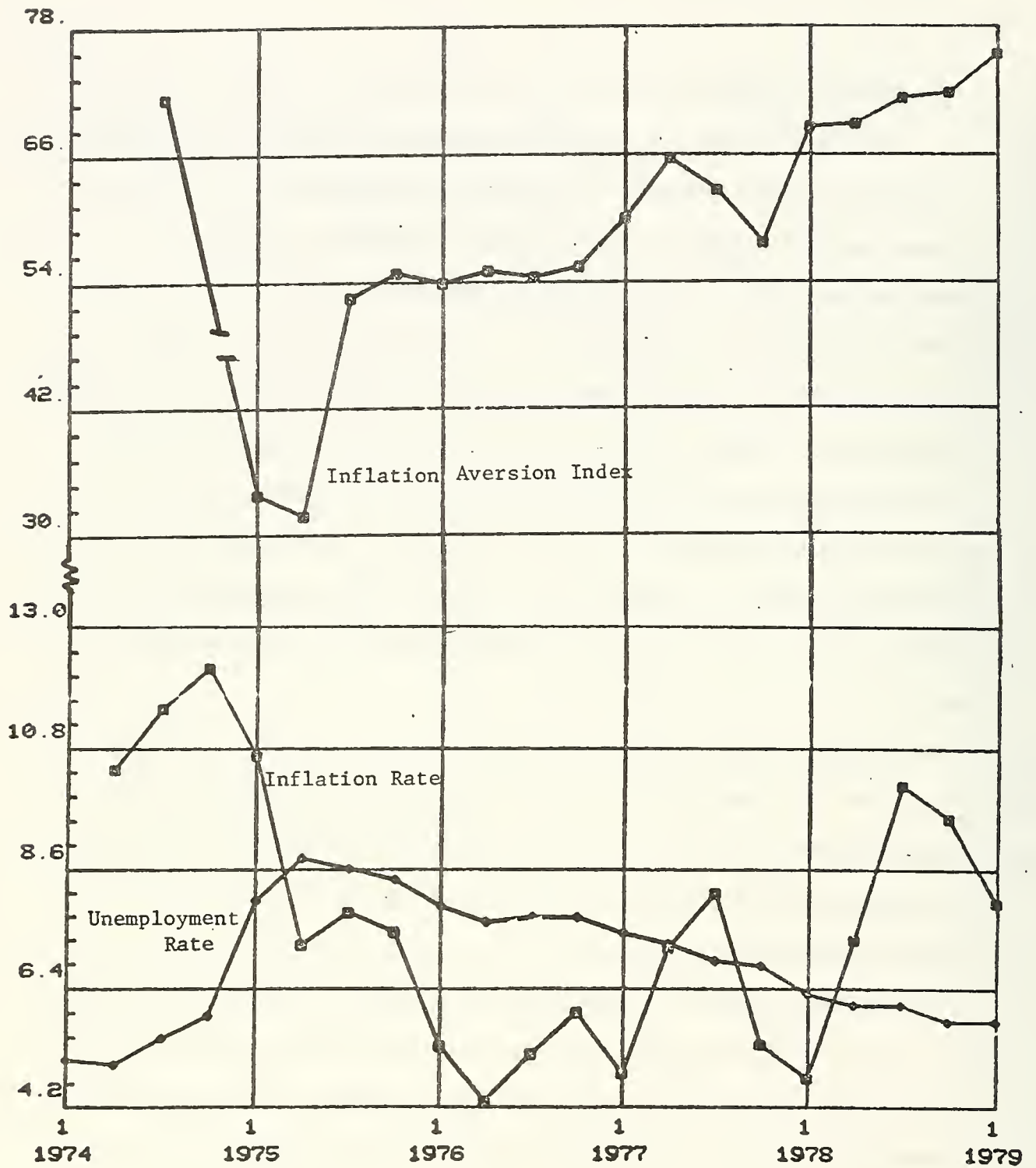
Characteristics which might have been expected to shape attitudes - such as income, education, sex - have an empirically small and generally insignificant effect. Age is the only demographic variable besides B/H that has a quantitatively large effect, but it does so in only two out of five periods. In general the pattern of responses is consistent with the assumption that individuals are answering the polls in terms of a view of society's, rather than their own, interests.

IV. Changes in Poll Results Over Time.

The cross sectional results of the previous section show that expectational variables and ethnic background are the most important variables determining poll responses at a moment of time. In this section we examine the effects of the past history of inflation and unemployment, along with expectational variables, on inflation aversion.

The dependent variable in the regressions reported below is the percentage of respondents who state that inflation is the more serious problem--this is the aggregate index of inflation aversion. Its time series behavior is shown in Figure 3, along with the actual rates of inflation and unemployment. The independent variables are expected inflation, expected unemployment and lagged values of inflation and unemployment,²⁰ The expected inflation variable is the average

Figure 3.



Notes: The inflation index is the percentage responding "Inflation" plus half of the percentage responding "Both".
The inflation rate is for the previous six months, at an annual rate
The unemployment rate is for the previous month

expectation based on responses to the question used in the cross section. We have constructed a quantitative expected unemployment variable from the qualitative question used in the cross section. Appendix 2 describes the method of construction of the expected unemployment variable and presents both expectational series over the entire period for which they are available.

The results of the regression described above are ²¹

$$(1) \quad PI = 101.5 + 1.38 DPE + .61 DP + .15 DP_{-1} - .01DPE_{-1} - .68 DPE_{-2}$$

(16.1) (.63) (.37) (.43) (.67) (.54)

$$-3.18 UE - 9.46 U + 4.51 U_{-1} + .82 U_{-2}$$

(3.60) (5.20) (1.61) (2.1)

$$\bar{R}^2 = .964 \quad SER = 2.29 \quad SSR = 42.022 \quad D.W. = 1.84$$

number of observations = 18

PI is the percentage resonding inflation, where those answering both were divided equally among inflation and unemployment.

DPE is the expected inflation rate, over the next year, expressed as a percentage

DP is the inflation rate since the last quarter, at an annual rate

(for the February poll it is the inflation rate from October to January, etc.)

UE is the expected unemployment rate for the next year, expressed as a percentage.

U is the actual unemployment rate in the month preceding the poll

The subscript -1 indicates a one quarter lag. Standard errors are in parentheses.

As expected, an increase in the expected rate of inflation increases inflation aversion while an increase in expected unemployment lowers it. Equation 1 also shows that an increase in the level of unemployment in the month preceding the poll lowers inflation aversion. In interpreting the coefficient on the lagged unemployment terms, note that $-9.46 U + 4.51 U_{-1}$ is the same as $-4.95 U - 4.51(U-U_{-1})$, so that the coefficients can be interpreted as showing that the change as well as the level of unemployment affect inflation aversion. The twice lagged unemployment rate is insignificant. Turning to the inflation variables, it is clear that higher inflation in the past, given expectations, increases the percentage responding inflation. The similar magnitudes of the coefficients on DP and DPE₋₂ and the apparent insignificance of DP₋₁ and DPE₋₁ suggest that only unanticipated inflation over the two quarters previous to the poll affect responses.

Equation 2 below presents the results of re-estimating equation 1 imposing the constraints that the coefficient on the twice lagged unemployment rate is zero and that lagged inflation matters only if it was unanticipated. ²²

$$(2) \quad PI = 106.1 + 1.42 DPE + .80(D2P - DPE_{-2}) - 5.09 UE - 2.34 U - 4.36 (U-U_{-1})$$

(9.1) (.51) (.27) (2.06) (1.94) (1.86)

$$\bar{R}^2 = .974 \quad SER = 1.95 \quad SSR = 45.622 \quad D.W. = 1.85$$

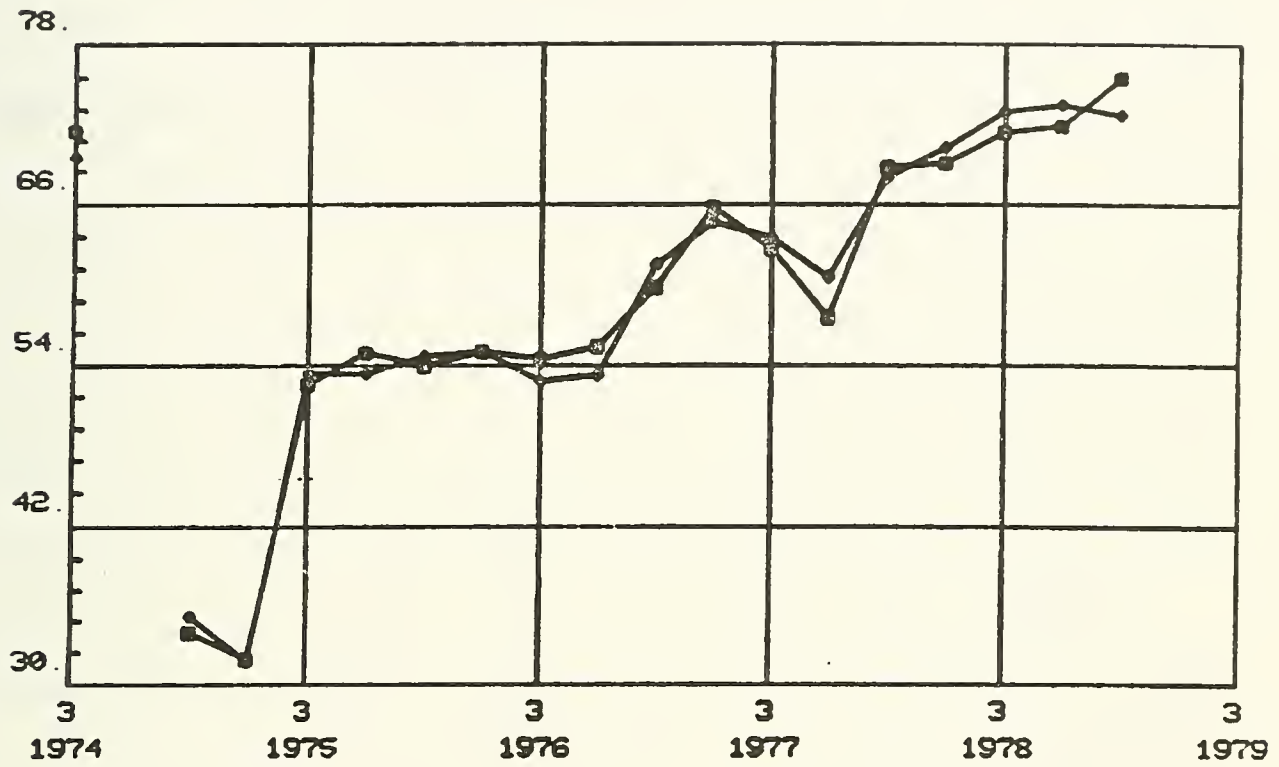
number of observations = 18

D2P is the rate of inflation over the last six months, expressed as a percentage, at an annual rate.

Figure 4 presents the actual level of the dependent variable and that predicted by equation 2.

FIGURE 4: Predicted and Actual Levels of Inflation Aversion; 1974-1979

(Square = Actual; Diamond = Predicted, from equation (2))



V. What Do the Poll Results Mean?

There are at least two types of information that economists would like to get from public opinion surveys. The first arises from the profession's difficulties in quantifying the costs of inflation: the polls appear to show that the costs of inflation are high relative to unemployment. Since rational policy making requires estimates of the costs of inflation and unemployment on alternative policy paths, evidence on their relative costs would be of value in choosing optimal policy.

Second, on the positive side, election studies showing that some opinion poll results are reflected in voting behavior,²³ media attention to the polls, and political rhetoric all suggest that the polls affect economic policy. For that reason, knowledge of the determinants of poll responses should increase understanding of economic policies that are likely to be accepted, as well as their subsequent political effects.

The evidence reviewed in this paper suggests that the poll results are of little help in providing the first type of information. They do indicate that there is a significant difference in people's perception of the social and private costs of inflation relative to unemployment, that the perceived relative social costs do depend (in the expected way) on both the actual and expected amounts of inflation and unemployment, and that at a given point in time there is a remarkable amount of agreement among individuals about the relative social costs of inflation and unemployment. However, due to the lack of a well specified trade-off to be considered by the respondents, this evidence on the relative costs of inflation and

unemployment does not enable one to make any statements about the desirability of certain policy alternatives. This is most forcefully brought out by the apparently inconsistent result that inflation is generally supposed to be the more serious problem while it is preferred that policy be directed at reducing unemployment.

Two additional points should also be made about the evidence from the polls with regard to the costs of inflation. First, there are survey questions which ask about the desired direction of policy in addition to asking about which is a more serious problem. The results are clearly that the public is in general not willing to fight inflation at the cost of higher unemployment - and that is exactly the choice that has been offered by most economists and governments. Unfortunately, it is not possible to discover the estimates of social costs that might underlie this response. As pointed out in Section II, the questions dealing with the welfare costs are sufficiently vague to allow a rational person to answer that inflation is a more serious problem while feeling that policy should be directed at lowering unemployment.

Second, the failure of the survey evidence to provide useful evidence on the social costs of inflation does not depend on the poll responses being either unstable or sensitive to the wording of the questions. The evidence reviewed in this paper, at least with respect to the questions about whether inflation or unemployment is a more serious problem suggests that responses are not very sensitive to the precise wording of the questions. Nor did we find much evidence that supports the contention that people fail to understand the effect of inflation on nominal incomes.

Turning to the second type of information economists may hope to get from public opinion polls, i.e. what determines the poll responses, the

strong conclusion is that the responses are very well explained by inflation and unemployment themselves. The main point of interest here is that it is not only actual, but also expected, inflation and unemployment that affect poll responses. To reduce concern over inflation it is necessary to reduce expected inflation and/or lower the amount of unexpected inflation. Of the two, expectations for the future appear to have the more significant effect. To lower concern over unemployment it is necessary to lower expected unemployment, the current level, and/or the current rate of change of the unemployment rate.

TABLE A1

Gallup Poll: "What do you think is the most important problem facing this country today?"

<u>Date</u>	<u>(Percent citing) Inflation</u>	<u>(Percent citing) Unemployment</u>
April 1939	0	36
November	0	24
June-July 1946	46	4
January 1947	13	2
July	24	0
September	37	0
March 1948	8	0
June	23	0
September 1949	11	12
November	9	6
March 1950	15	10
September 1951	24	0
March 1954	13	16
June 1955	5	2
September 1956	10	4
October	13	3
May 1957	21	0
August-September	22	0
September 1958	8	11
February 1959	17	9
April	15	10
September	13	3

<u>Date</u>	<u>Inflation</u>	<u>Unemployment</u>
February 1960	8	5
June	2	25
April 1962	10	8
March 1963	4	11
September	3	5
April 1964	5	9
June	3	6
August	3	4
September	6	4
March 1965	3	2
May	4	3
September	5	0
October-November	6	0
November	3	0
May 1966	16	2
August	16	0
October-November 1967	16	0
May 1968	8	0
June-July	9	0
August	7	0
January 1969	9	0
May 1970	10	0
July 1972	16	7
May 1973	39	4
September	50	2

<u>Date</u>	<u>Inflation</u>	<u>Unemployment</u>
January 1974	25	5
May-June	48	2
August	77	2
September	81	2
October	79	3
February-March 1975	60	20
July	51	21
October	57	21
January 1976	47	23
April	38	24
October (early)	45	33
October (late)	47	31
March 1977	58	39
July	32	17
October	35	25
February 1978	33	17
April	54	18
July	60	14
September	59	12
October	75	8

TABLE A2

Michigan Poll: "Which of the two problems - inflation or unemployment - do you think will cause the most serious economic hardship for people during the next year or so?"

<u>Date</u>	(Percent citing)	(Percent citing)	(Percent citing)
	<u>Inflation</u>	<u>Unemployment</u>	<u>Both</u>
1974: III	67.0	25.1	5
1975: I	29.7	60.8	6.2
: II	28.8	64.1	4.7
: III	43.7	38.6	16.5
: IV	45.6	36.1	15.8
1976: I	44.5	36.7	16.8
: II	46.2	36.5	13.5
: III	47.6	38.9	10.7
: IV	48.6	38.1	9.7
1977: I	54.2	35.0	7.9
: II	61.1	30.4	6.2
: III	56	32	7
: IV	52	37	9
1978: 1	55	33	9
2	62	26	8
3	56	33	8
4	64	27	7
5	63	26	8
6	69	22	7
7	63	25	8
8	66	24	8
9	65	26	5
10	73	18	6
11	65	23	8
1979:2	67	24	7

Appendix 2

In order to construct the expected unemployment series we assume that at time t , a respondent has a subjective probability distribution for the unemployment rate in each of the four upcoming quarters.¹ The means of these distributions for individual i at time t are denoted by \bar{U}_{t+1}^i , \bar{U}_{t+2}^i , \bar{U}_{t+3}^i and \bar{U}_{t+4}^i . It is assumed that a respondent will answer that he expects the unemployment rate to rise if $UE_t^i \equiv 1/4 (\bar{U}_{t+1}^i + \bar{U}_{t+2}^i + \bar{U}_{t+3}^i + \bar{U}_{t+4}^i) > U_t(1+d)$ where U_t is the current unemployment rate and d is a parameter to be estimated.² Likewise, a respondent is assumed to answer that he expects the unemployment rate to fall if $UE_t^i < U_t(1-d)$ and to answer that he expects no change in the unemployment rate if $U_t(1-d) \leq UE_t^i \leq U_t(1+d)$.

We also assume that the UE_t^i are distributed according to a triangular distribution in each time period. The probability density function is given by equation (1) below.

$$(1) \quad f_t(x) = \begin{cases} (4/(b_t - a_t)^2) (x - a_t) & \text{if } a_t \leq x \leq \frac{a_t + b_t}{2} \\ (4/(b_t - a_t)^2) (b_t - x) & \text{if } \frac{a_t + b_t}{2} \leq x \leq b_t \end{cases}$$

where $0 \leq a_t \leq b_t \leq 1$

This distribution is symmetric about its mean, $UE_t = \frac{a_t + b_t}{2}$, and has variance $S_t^2 = (b_t - a_t)^2 / 24$.

Using these assumptions, it is not hard to show that in a random sample the expected value of the percentage answering that they expect a rise in the unemployment rate is $1 - F_t(U_t(1+d))$ where $F_t(x)$ is the cumulative distribution function for a random variable whose density function is given by (1). Similarly the expected value of the percentage expecting a fall is $F_t(U_t(1-d))$. If we denote the expected value of the percentage expecting a rise and the percentage expecting a fall in period t as \bar{P}_{1t} and \bar{P}_{2t} respectively, we arrive at equations (2) and (3),

$$(2) \quad \bar{P}_{1t} = 1 - F_t (U_t (1 + d))$$

$$(3) \quad \bar{P}_{2t} = F_t (U_t (1 - d))$$

By setting \bar{P}_{1t} and \bar{P}_{2t} equal to the percentages actually observed in period t , equations (2) and (3) become two equations with two unknowns (a_t and b_t)³. Furthermore, the equations can be rewritten so that they are linear in UE_t and S_t . To see this note that the right hand side of equation (2) is the probability that a random variable X , with density function given by equation (1), will be greater than $U_t (1 + d)$. This is equal to the probability that a random variable $Y = (X - UE_t) / S_t$ is greater than $[U_t (1 + d) - UE_t] / S_t$. Since the probability density function for Y is independent of a_t and b_t , we can rewrite equation (2) as

$$(2') \quad U_t (1 + d) - UE_t = G (1 - \bar{P}_{1t}) S_t$$

where G is the inverse cumulative distribution function for Y .⁴

Similarly, equation (3) can be rewritten as

$$(3') \quad U_t (1 - d) - UE_t = G(\bar{P}_{2t}) S_t$$

Substituting S_t out of equations (2') and (3') yields

$$(4) \quad UE_t = U_t [1 + d (G(\bar{P}_{2t}) + G(1 - \bar{P}_{1t})) / (G(\bar{P}_{2t}) - G(1 - \bar{P}_{1t}))]$$

In order to use equation (4) to construct an expected unemployment variable one more piece of information is needed; d is still an unknown. We estimated d by imposing rationality on the sample for the time period 1960 to 1978. That is, we suppose $\bar{U}_t = UE_t + V_t$ where $\bar{U}_t = 1/4 (U_{t+1} + U_{t+2} + U_{t+3} + U_{t+4})$ and V_t is a random variable with mean zero that is uncorrelated with both U_t and UE_t . This implies a regression model

$$\bar{U}_t - U_t = d U_t (G(\bar{P}_{2t}) + G(1 - \bar{P}_{1t})) / (G(\bar{P}_{2t}) - G(1 - \bar{P}_{1t})) + V_t$$

The results of estimating this regression are presented in equation (5) below.

$$(5) \quad \bar{U}_t - U_t = .116 U_t (G(\bar{P}_{2t}) + G(1 - \bar{P}_{1t})) / (G(\bar{P}_{2t}) - G(1 - \bar{P}_{1t}))$$

(.02)

$$\bar{R}^2 = .38 \qquad \text{SER} = .61 \qquad \text{D.W.} = 0.70$$

Standard errors in parentheses

The fact that d is estimated to be .116 in our model implies that if the unemployment rate is 5%, respondents answer that they expect no change when UE^i is between 4.4% and 5.6%. This range is not totally unreasonable. The low Durbin - Watson statistic is to be expected since the error $(\bar{U}_t - UE_t)$ contains four different expectational errors; one for each of the four upcoming quarters.

Table A3 contains the expected unemployment variable constructed according to equation (4) with $d = .116$. Table A4 contains the expected inflation variable.⁵

¹The procedure followed here is similar to that of Carlson and Parkin in "Inflation Expectations", *Economica* 42, pp. 123-138.

²The survey question is stated, "How about people out of work during the coming 12 months - Do you think that there will be more unemployment than now, about the same, or less?"

³Since the survey includes close to 1500 respondents, the observed percentages should be very close to their expected values, i.e., the true population percentages.

⁴The random variable Y has an inverse cumulative distribution function of the form

$$G(Y) = \begin{cases} - (6)^{1/2} + (12Y)^{1/2} & 0 \leq Y \leq 1/2 \\ (6)^{1/2} - (12(1-Y))^{1/2} & 1/2 \leq Y \leq 1 \end{cases}$$

⁵ For a thorough explanation of how this variable was constructed see Juster, F.T. and Comment, R., "A Note on the Measurement of Price Expectations", 1978 manuscript, University of Michigan.

Table A3: Expected Unemployment

	<u>1st Qtr</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr</u>
1960	NA	NA	NA	5.9
61	NA	6.4	NA	5.9
62	NA	5.4	5.7	5.6
63	5.9	5.9	5.4	5.7
64	5.6	5.1	NA	NA
65	5.0	NA	4.1	3.9
66	3.4	3.7	3.7	3.6
67	3.8	NA	3.7	NA
68	NA	3.5	3.5	NA
69	3.5	3.5	3.7	4.0
1970	5.0	5.5	5.7	6.8
71	6.4	6.5	6.4	6.3
72	5.7	5.7	5.6	5.5
73	5.6	NA	5.1	5.1
74	6.5	5.6	6.5	8.0
75	9.4	9.4	8.3	8.5
76	7.4	7.2	7.5	7.5
77	6.9	6.6	6.9	6.9
78	6.2	6.2	6.2	6.1
79	6.0	-	-	-

Note: NA indicates not available.

TABLE A4: Expected Inflation

<u>Date</u>	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>
1948	1.27	-.33	1.01	.15
1949	-.70	-.62	-.54	-.43
1950	-.33	.39	1.11	1.83
1951	2.57	1.07	1.50	1.94
1952	1.62	.64	.16	-.32
1953	-.30	-.28	-.26	-.23
1954	-.25	-.28	-.26	-.24
1955	-.02	.20	.52	.84
1956	.89	.95	1.27	1.36
1957	1.28	1.21	1.17	1.13
1958	.75	.38	.79	1.21
1959	1.37	1.53	1.66	1.79
1960	1.67	1.56	1.40	1.24
1961	1.88	1.88	1.91	1.94
1962	2.25	1.94	1.73	1.91
1963	2.54	2.40	2.27	2.14
1964	2.46	2.48	2.50	2.52
1965	2.54	2.61	2.69	2.72

<u>Date</u>	<u>1st Quarter</u>	<u>2nd Quarter</u>	<u>3rd Quarter</u>	<u>4th Quarter</u>
1966	2.63	3.86	4.78	4.34
1967	3.91	4.28	4.65	5.09
1968	4.78	4.47	5.11	3.87
1969	4.53	5.48	5.49	4.07
1970	5.51	6.04	4.32	5.40
1971	5.21	4.65	3.53	4.01
1972	4.18	3.04	3.87	3.91
1973	6.78	6.11	7.63	6.43
1974	9.97	9.41	9.26	10.66
1975	5.40	3.44	7.81	7.24
1976	5.80	5.82	5.40	4.80
1977	7.40	6.90	7.20	6.90
1978	7.80	8.20	9.80	8.90
1979	10.70			

Appendix 3

The statistical model that underlies regressions 1-5 is an ordered probit model. That is, individual i is assumed to have a certain marginal rate of substitution between inflation and unemployment. This is assumed to be linear in the parameter vector B so that $MRS_i = X_i B + e_i$ where X_i is a $1 \times n$ vector of personal characteristics and e_i is a normally distributed random variable with mean zero and variance S^2 . It is assumed the e_i and e_j are uncorrelated for i not equal to j . Given this framework, an individual is presumed to answer that inflation is a more serious problem than unemployment if $MRS_i > t_2$ for some unknown parameter t_2 . If $t_1 < MRS_i < t_2$ (for unknown parameter t_1) the respondent is assumed to answer that both inflation and unemployment are serious problems. If $MRS_i < t_1$, the respondent is assumed to answer that unemployment is the more serious problem. As in the regular probit case, writing out the likelihood function shows that only $B/(S^2)^{1/2}$ is identified. Hence, we have normalized $S^2 = 1$.

A complication that arises in the ordered probit case that is absent in the regular probit case is that if we include a constant term in X_i , and we denote its coefficients B_1 , B_1 and the threshold points are not all identified. Specifically one of the coefficients must be normalized. We have chosen to normalize $t_1 = 0$ so that we present (in Table A5) estimates of $B_1 - t_1$ and $t_2 - t_1$. This latter term is thus the range of indifference between inflation and unemployment.

Appendix 4

The variables used in the regressions reported in Tables 6 and 7 were scaled in the following manner:

- | | | | |
|--------------|---|---|----------------|
| B/H: | 1 | - | White |
| | 2 | - | Black/Hispanic |
| Sex: | 1 | - | Male |
| | 2 | - | Female |
| Education: | 1 | - | 0-5 years |
| | 2 | - | 6-11 " |
| | 3 | - | 12 " |
| | 4 | - | 13-15 " |
| | 5 | - | 16+ " |
| Education +: | 1 | - | 16+ " |
| | 0 | - | otherwise |
| Age: | 1 | - | 18-20 years |
| | 2 | - | 21-24 " |
| | 3 | - | 25-34 " |
| | 4 | - | 34-44 " |
| | 5 | - | 45-54 " |
| | 6 | - | 55-64 " |
| | 7 | - | 65+ " |

Age ² :

1	-	18-20	years
4	-	21-24	"
9	-	25-34	"
16	-	35-44	"
25	-	45-54	"
36	-	55-64	"
49	-	65+	"

Expected Unemployment:

1	-	less
3	-	same
5	-	more

Income:

1	-	\$0 -4,999
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(1975)

2	-	\$5,000 - 9,999
3	-	\$10,000 - 14,999
4	-	\$15,000 - 19,999
5	-	\$20,000 - 24,999
6	-	\$25,000 - 29,999
7	-	\$30,000 - 34,999
9	-	\$35,000 +

Income:	1:	\$0-4,999
(1977-78)	2:	\$5,000-9,999
	3:	\$10,000 - 14,999
	4:	\$15,000 - 19,999
	5:	\$20,000 - 24,999
	7:	\$25,000 +

Expected Inflation	0:	< 0%
	1:	0%
	2:	1-4%
	3:	5%
	4:	6-9%
	6:	10 +%

The income variable appears in two forms since the responses are tabulated differently at different times by the Michigan Survey. The income variable is for the total family unit and is before tax. All other variables are self explanatory.

Table A5 contains the estimates of parameters for regressions 1-5 which are not presented in Table 6 in the text.

TABLE A5: Estimation Results from Regressions 1- 5.

<u>Date</u>	<u>Regression</u>	<u>Constant</u>	<u>Threshold Point</u>
Feb.. 75	1	-.33 (0.7)	.15 (6.4)
Nov. 75	2	.46 (1.4)	.39 (13.9)
Dec. 77	3	.76 (1.9)	.21 (8.9)
Feb. 78	4	.69 (1.7)	.17 (7.6)
May 78	5	.68 (1.8)	.18 (7.9)

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FOOTNOTES

1. This question has been asked by the University of Michigan Institute for Social Research since 1974. We shall henceforth describe this as the standard question.
2. The Roper Center at the University of Connecticut collects opinion poll results systematically, and makes the results available in a convenient form. The journal Public Opinion reports interesting findings from polls on a regular basis.
3. Appendix 1 contains the dates and responses from Gallup polls from 1939 to 1978. They are reproduced from the Gallup Opinion Index (November 1978), number 160, page 19. Douglas A. Hibbs (1979) has also examined this data.
4. However, given the presence of other problems than inflation and unemployment as possible answers to the Gallup question, it is not certain that the responses shown in Figure 1 would be obtained if individuals were asked merely to rank the seriousness of inflation and unemployment.
5. This statement is based on an econometric examination of the complete time series for the periods in which they overlap.
6. Results similar to those of the Harris poll can be found in the New York Times/CBS poll. In April 1978 the question was asked "In the last few years would you say that inflation or unemployment has caused a more serious hardship for your family?" The responses were 92.6% inflation and 7.4% unemployment. Although no question about which was a more serious problem for the country was asked at the same time, the April 1977 poll did include such a question. The answers then were 59.5% inflation and 40.5% unemployment.
7. For evidence on how well the public understands the actual relationship between inflation and unemployment, see Huizinga (1979).

FOOTNOTES (2)

8. Answers to the policy choice question could also be made on the basis of the intersection points of the PP curve with the axes. If indifference curves are parallel and linear, and the PP curve is linear, then the policy choice based on relative slopes at A is the same as the policy choice based on intersections with the axes.

9. See George Katona (1975).

10. See Seymour Martin Lipset (1976) for a discussion of this phenomenon.

11. See for example Gallup Opinion Index (November 1978), Report 160, pp 13-20.

12. However, since the Michigan survey does not follow individuals through time, we are unable to do a combined cross-section time-series analysis.

13. The other polls are omitted to keep the table simpler. We will footnote circumstances in which the results in the remaining two polls differ substantially from those presented in the table. Regression results are presented below for all five polls.

14. A longer version of Table 5 is available on request. The present version either contains data to which we want to refer later or characteristics that are not included in the regression of Table 5, but which nonetheless are of interest.

15. If people were answering in their personal interest we would expect the unemployed to be considerably more worried about unemployment. A possible exception to this would be if people thought inflation caused unemployment. This seems to be contrary to the evidence of the previous section, however, which showed people to perceive a trade-off between inflation and unemployment.

16. The sole exception is May 1978.

FOOTNOTES (3)

17. The expected inflation variable is the response to a question about inflation expected for the next year asked of all respondents who are asked the inflation/unemployment question. The expected unemployment variable is from a question which asks if the respondent expects more, less, or the same amount of unemployment in the upcoming year.

18. The model is the same as described by Thomas Johnson (1972).

19. The powerful role of expectations in the regressions raises the question of whether expectations reported to the pollsters might merely represent rationalizations of underlying attitudes rather than true expectations. There are a number of ways in which the notion of rationalizing expectations might be formalized; the method we have chosen suggests that expectations are not obviously rationalizations. Details are available on request.

20. Since the racial make-up of the sample does not change much over the sample, omitting a measure of racial composition should not affect the time series results.

21. This regression was run after earlier experimentation showed that annual rates of inflation and unemployment did a poor job of explaining the behavior of the inflation aversion index. It was decided to use lags of up to two quarters in light of the limited number of observations we have. Similarly, we did not experiment with the length of lag on the expected unemployment variable because we find the argument that lagged unexpected unemployment rather than lagged actual unemployment should affect inflation aversion much weaker than that relating to unanticipated and actual inflation. However, we have run regressions including lagged unanticipated unemployment in place of lagged actual unemployment and find that these perform about as well as the regression reported in the text.

FOOTNOTES (4)

22. Examination of the sums of squared residuals in equations 1 and 2 shows that the F-statistic has a value of .23 compared with $F_{.95}(4,8) = 3.84$, the critical value using a 5% significance level.

23. Bruno Frey and Friederich Schneider (1978) examine the effects of economic conditions on presidential popularity as measured by opinion polls, and the effects of popularity on policy.



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